

ABSTRACT

This invention provides methods for determining drug specificity, therapeutic index and effective doses for individual patients. According to the methods of the invention, graded levels of drug are applied to a biological sample or a patient. A plurality of cellular constituents are measured to determine the activity of the drug on a target pathway and at least one off-target pathway. A drug specificity is determined by comparing the target and off target activities of the drug. A therapeutic concentration (or dose) is defined as a concentration (or dose) of the drug that induces certain response in the target pathway. A toxic concentration (or dose) is defined as a concentration (or dose) of the drug that induces certain response in the off target pathway. Therapeutic index is the ratio of the toxic concentration over therapeutic concentration. Methods are also provided to determine an effective dose of a drug for a patient by measuring the activity of the drug on the particular patient.